Method of creation of a new communication network by a wireless terminal and terminal implementing the method

The invention relates to a method of creation of a new network by a terminal, more specifically when the terminal was initially associated to an existing network. The invention also relates to the terminal itself. It is particularly applicable in the context of wireless networks with centralized control, although not limited to this context.

A HIPERLAN 2 type centralized wireless communication network has limited resources. When a large number of terminals are associated to the network, some terminals may be incapable of reserving the resources required for their applications.

The document "ETSI TS 101 761-4 V1.4.1A (2002-5) BRAN HIPERLAN Type 2, Data Link Control (DLC) Layer; Part 4: Extension for Home Environment, section 6.7.1 'Dynamic Central Controller Selection / Principle'" discloses that a wireless terminal that is capable of becoming central controller, and for which an attempt to associate to a central controller of an existing network fails, itself attempts to become central controller by initiating the central controller selection process described in the aforementioned document.

The invention relates to a method of creation of a new communication network by a wireless terminal, which method is characterized in that, the wireless terminal initially being part of an existing centralized network that includes an access point able to control the association of wireless terminals to its network, it includes, for the associated terminal, the steps of:

- disassociation of the terminal from the network; and
- initiation of a procedure for creating a new network including a declaration of the terminal as access point of the new network, where the operating parameters of the new network are such that communications on the new network do not interfere with the existing network.

Thus, a terminal previously associated to a network, but disassociated from this network, can create a new network, not interfering with the initial network. New resources are then available.

According to a preferred embodiment, the terminal takes the initiative for the disassociation. The terminal can decide on this disassociation if for example the access point of the initial network does not respond favourably to certain requests, for example regarding the allocation of resources of the existing network.

Other features and advantages of the invention will become apparent through the description of a nonlimiting example embodiment, explained with reference to the accompanying figures, in which:

- figure 1 is a diagram showing information exchanges between the terminal and the access point in the case of a disassociation after association;
- figure 2 is a diagram of the same type as figure 1 in the case of a rejection of initiation of a change of frequency by the access point;
- figure 3 is a diagram of the same type as figure 1 in the case of a connection setup rejection;
- figure 4 is a flowchart of the method according to the example embodiment.

The example embodiment fits into the context of a HIPERLAN 2 communication network. HIPERLAN 2 is a standard under development by ETSI (European Telecommunications Standards Institute). In this type of network in which communication takes place by radio waves of about 5 GHz, a unit called Access Point (AP) or Central Controller (CC) manages the access of other network devices to the transmission medium. These other devices are called wireless terminals or Mobile Terminals (MTs). To be able to access the network, a wireless terminal must first associate to the access point. The relevant procedure is described in particular in the following document:

"ETSI TS 101 761-2 V.1.4.1A (2002-05) Broadband Radio Access Networks (BRAN); HIPERLAN Type 2: Data Link Control (DLC) Layer; Part 2: Radio Link Control (RLC) Sublayer", and in particular section 5.1 "Services supporting ACF (Association Control Function)".

According to the present example embodiment, there can be various reasons for a non-association of a wireless terminal to the access point, or a disassociation of an associated wireless terminal.

Figure 1 is a diagram of a network having an access point AP/CC and a wireless terminal MT. Other wireless terminals of the network are not

illustrated. A wireless terminal typically has an interface with the communication medium (the wireless network) and a microprocessor running applications and appropriate protocols, the code for this being stored in a memory inside the terminal. The diagram of figure 1 indicates the information exchanged between the two devices during an attempt of association of the wireless terminal MT to the access point AP/CC. The wireless terminal, once activated, analyses the radio activity to detect the presence of a network having characteristics that enable - a priori - an association. These characteristics include in particular the network identity and are broadcast in the data frame controlled by the access point.

The terminal starts a dialogue with the access point to exchange parameters such as the list of supported convergence layers and whether a wireless terminal can transmit in direct mode to another wireless terminal. In figure 1, it is assumed that the association takes place. Later, with the mobile terminal now associated, the access point may decide arbitrarily to disassociate this terminal.

Furthermore, a wireless terminal associated to an access point may be disturbed by a device of another network using the same frequency. In this case, the wireless terminal can request the access point to which it is associated to perform a change of frequency of the network. This process is referred to as DFS (Dynamic Frequency Selection). The access point can however refuse to change frequency, and the wireless terminal can then disassociate itself. The wireless terminal can also disassociate itself if the access point did not reply to the DFS request in a predetermined time. This scenario is illustrated in figure 2.

Figure 3 represents the network in the state in which the wireless terminal is associated to the access point. The wireless terminal issues a connection setup request to the access point. The latter can reject the request, notifying the wireless terminal of the rejection. This can happen if the traffic level on the network is significant. According to the present example embodiment, an application of the mobile terminal then decides to disassociate itself from the network, at least for some types of connection. According to the present embodiment, this disassociation is initiated only if no other connection in the network involves the mobile terminal in question.

Figure 4 is a flowchart of the method according to the present example embodiment. Following rejection of a request, such as (for example) the establishment of a connection or of a change of frequency, the wireless terminal disassociates itself from the existing network. In the two other cases that were described, the wireless terminal is already disassociated (in the examples mentioned, either following a decision by the access point, or following an association rejection by the access point).

The disassociated wireless terminal then sets itself up as access point of a new network.

Where possible, it will advantageously use a frequency that is different from the initial network with the aim of avoiding any interference. If the new network is created following a frequency change rejection, then the new network will advantageously use a frequency that is different from the frequencies of the initial network and the interfering network. To this end, the mobile terminal can initiate the central controller selection process mentioned in the introduction.

The new access point cannot a priori advertise its new status to the already associated terminals. It is the task of another terminal, once disassociated, to search for the new access point and associate to it.

According to an embodiment, several terminals of the same existing network can decide to disassociate from the existing network to create their own network. These terminals then initiate a selection process to determine which of these terminals will be the access point of the new network. The elements for making the disassociation decision can be communicated between the devices over the existing network. Therefore the new network enables the saturation of some resources of the initial network to be avoided, by operating at another frequency.